REMARKS

The Office Action of June 30, 2005 has been received and its contents carefully considered. Claim 7 has been canceled. Claims 1-6, 8 and 9 remain pending in the application.

Claims 1-2 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Garces et al (U.S. Patent No. 5,450,306) in combination with Tanaka Yoshiyuki (JP 2001057782).

Claims 7-9 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Garces et al. (U.S. Patent No. 5,450,306) in combination with Tanaka Yoshiyuki (JP 2001057782) and further in combination with Walker (U.S. Patent No. 5,091,840).

Claim 1 now also recites the features of claim 7.

Figure 1 shows an exemplary embodiment of a converter circuit protection device as disclosed in the instant application. The exemplary figure illustrates that DC voltage circuit subsystem 2.1 comprising a first energy store 3 and a second energy store 4 which are connected in series with a fuse 5 connected therebetween. Each of the three phases R, S, T have at least one pair of branches 6 comprising power semiconductor switches. A second drivable short-circuit element is preferably connected between the pair of branches 6 and the busbar system of the DC voltage circuit 1.

The illustrated embodiment of the converter circuit also shows at least one second drivable short-circuit element 7, which is connected in parallel with the DC voltage circuit subsystem 2.1. In the event of a short circuit of one or more of the drivable power semiconductor switches of the pair of branches 6, the second

drivable short-circuit element 7 ensures that a short-circuit current from the energy stores 3, 4, or from the phases R, S, T only briefly flows through the short-circuited power semiconductor switch or switches of the corresponding pair of branches 6.

The second drivable short-circuit element 7 is driven when a short-circuit current is detected in or around a pair of branches 6 by a detection device. The second drivable short-circuit element, in this case, is short-circuited by corresponding switching of the DC voltage circuit 1. An advantage of the second drivable short-circuit element is that the two energy stores 3 and 4 of the DC voltage circuit subsystem 2.1 are discharged at an earlier stage by the switching of the second short-circuit element 7, thereby allowing fuse 5 to respond more quickly. Early response of the fuse 5 can help to protect a pair of branches 6, which can be affected by the short circuit in the other pairs of branches 6 against further damage or destruction.

The foregoing features are broadly encompassed by Applicants' claim 1, which recites, among other features, a drivable short-circuit element, wherein the drivable short-circuit element is connected in parallel with the DC voltage circuit subsystem, whereby the drivable short-circuit element is driven when a short-circuit current is detected in or on a pair of branches by means of a detection device and the drivable short-circuit element short-circuits the DC voltage circuit by corresponding switching.

With regard to the applied Garces, Tanaka and Walker documents, the Applicants respectfully submit that the features of claim 1 are not suggested or taught by these documents, either individually, or in the manner relied upon by the Examiner. Walker is directed to the control of a DC current source, not a DC voltage

source as recited in the claims. Walker discloses a DC current source (16) that is short-circuited by a thyristor (24) on a selective basis to provide a notch of variable duration to effectively transfer power (See column 6, lines 6-16). Walker asserts that thyristor (24) relieves the switch devices of the bridge circuit of that part of the duty cycle short-circuiting the DC current source (16). This is a different circuit configuration and function than the drivable short-circuit element as recited in the Applicants' claims. According to exemplary embodiments, encompassed by Applicants' claimed combination short-circuit currents which are potentially very high and have a high rate of change (e.g. due to a voltage of the DC voltage source being fixed, and being the only applied voltage) can be addressed.

Garces or Tanaka fail to disclose or suggest any need to address a lack of short circuit protection. In addition, Walker teaches that thyristor (24) is used to control a voltage waveform and is not provided for short-circuit protection of a shorted branch pair. Accordingly, one of ordinary skill in the art would not have been motivated to combine features of the Garces patent with features of the Tanaka patent and the Walker patent to disclose a converter circuit with short-circuit protection as recited in Applicants' independent claim 1. As such, claim 1 and all claims that depend therefrom are allowable.

Applicants respectfully request reconsideration and allowance of the above-captioned application.

Should any questions arise in connection with this application, or should the Examiner believe a telephone conference would be helpful in resolving any remaining issues pertaining to this application, the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

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